

# POLKU

Designing an interactive sound installation based on soundscapes.

Master's Thesis  
Jairo Acosta Lara

Aalto University  
School of Arts, Design and Architecture  
Media Lab Helsinki  
Master's degree programme in Sound in New Media  
April 2015

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**Author** Jairo Acosta Lara

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**Title of thesis** Polku: Designing an interactive sound installation based on soundscapes

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**Department** Department of Media

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**Degree programme** Master's Degree Programme in Sound in New Media

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**Year** 2015

**Number of pages** 56

**Language** English

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### Abstract

My master thesis is a written report of the process behind the design, construction and exhibit of the interactive sound installation Polku. The thesis also offers an overview of the use of soundscapes within sound related practices, and relates them to my own work based on a reflexion on the use of soundscapes in artistic context.

Polku is an interactive sound installation made by fellow Media Lab student Valtteri Wikström and me. Polku's main idea is to create a collage of sounds that belong to Finnish soundscapes, and that can be explored interactively. The piece was exhibited in Japan in 2014 and this thesis is an aftermath of the whole process.

The thesis develops two ideas that were determinant for the design of Polku as well as my own artistic views: soundscapes as narration and soundscapes as recreation. I try to analyse what are the main tools for working with soundscapes within these two contexts, and how work of arts based on soundscapes can produce different results according to the function and use of the sonic elements.

The process of building Polku offered great insight on the use of soundscapes in artistic practices. Based on feedback, there is a very powerful link between people and their sonic surroundings, and I believe the work provided me with new insights on how to approach the use of soundscapes to enhance this link and create new sonic experiences.

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**Keywords** soundscape, soundscape art, sound art, interactive installation, soundscape compositions, film sound

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## ACKNOWLEDGMENTS

I would like to thank some people that helped me to complete this thesis and that were of great importance for me during my studies:

First of all I would like to thank Valtteri Wikström for all the work building Polku. His knowledge was a great learning experience for me, and it was really encouraging to work with him.

I also want to thank Antti Ikonen, Matti Niinimäki and Shinji Kanki, for the valuable teachings, lessons, comments, feedback, and everything else that made my studies at Media Lab an unforgettable experience.

Thanks goes also to my schoolmates that were part of the exhibition in Japan: Ari-Pekka Leinonen, Saku Kämäräinen, Kirsi Ihalainen, Johanna Rotko and Juan Duarte Regino. Working with them was a remarkable experience. I'm also grateful to Janne Lehtimäki for his assistance while building Polku and Pipsa Asiala for her constant support during the process towards the exhibition.

Finally I would like to thank my family Terhi, Alba and Ilma, for the support, patience and love.



## INTRODUCTION

Throughout my career and studies in the field of sound, I've always ended up, in one way or the other, working up with similar elements and same ideas. "The Soundscape" is the concept that embraces all those ideas under the same umbrella. Film sound, experimental music and field recordings are some of these practices, and in all of them, there's the idea of the environment and the sonic surroundings. Especially in my work with moving images, I've tried to recreate atmospheres that convey narrative sense and feel

By the end of 2013, some of us students at Media Lab got the opportunity to develop our own sound works aiming towards a joint exhibition to be held in may 2014 in Tokyo, Japan, in a place called Spiral Building.

Four works developed by students were selected under the curatorial observance of composer and teacher Shinji Kanji, who was in part responsible for the possibility of exhibiting in Japan.

Fellow student Valtteri Wikström and I developed POLKU, an interactive sound installation. Polku's main idea was to bring to Japan a snapshot of what Finnish soundscapes could sound like. For this purpose we developed an interactive system that allowed users to explore and discover the new sounds.

Valtteri was the interaction designer of the piece. He designed the software used in the interaction using Pure Data, prepared all the scales, designed the circuits and connections, and built the entire system to obtain the user data that would trigger the sounds.

I took care of the main sound design. I recorded the sounds to be used in the installation and prepared them for the piece. I also designed the main sound reproduction system, choosing the speakers, their position and how they would be connected.

The possibility to work with Polku and to exhibit in Japan was an extremely important experience for me. I learned a lot about myself as an artist, as well as the use of soundscapes and their meaning in art. This thesis presents my ideas about the subject, and also provides a framework for my analysis of what I understand as soundscape art.

## **ABOUT THIS THESIS**

Polku is an interactive sound installation that could be defined as a work of art working with soundscapes. As I mentioned in the introduction, there are two main aspects related to soundscapes that I'm interested in, and that are discussed in the first three chapters of this work:

The first chapter tries to provide a definition of the term soundscape and presents a short historical framework to achieve it. At the same time, the chapter asks the question about the existence of soundscape-based art.

The second chapter is about soundscapes as narration. In this chapter I take a look at some sound practices that use soundscape elements as main tools for constructing narratives. Sounds create strong mental images. When they are together forming a unity like a soundscape, each of these elements works in conjunction with the others, creating a narrative for a specific location. Some practices that relate to this idea of narration are soundscape composition, film sound design and game sound design, among others.

The third chapter discusses the issue of authenticity. Are soundscape artworks supposed to recreate an existing environment and is this even possible? There are practices that address this issue and some of them will be discussed in this chapter.

The division between narrative and recreation in soundscapes is not mutually excluding. Different types of soundscape practices belong to both categories. The reason behind the division in this thesis is my own artistic view on the goals and approaches behind Polku, where precisely

the aspects of narration and recreation were the main creative triggers and the more interesting to analyze.

The second part of this thesis starts in the fourth chapter and gives an insight into Polku. In this part, I discuss several of the elements that I consider of relevance in the piece: sound design, visual design, aesthetic approaches and the setup and exhibit in Japan. Also relevant to the work is the mention of the visitor's feedback for the pieces and new ideas that came up from the exhibition.

There are several other soundscape-related practices not mentioned in this thesis. Among this practices worth mentioning are those intrinsic to radio: feature, drama and experimental. The main reason why I don't discuss these practices in the text is because I don't have much experience working with them. I felt it was important for the thesis to name practices that were close to my background and how they inspired the ideas behind Polku.

Attached to the written part is a DVD-disc. In the disc there are videos and photographs of the installations. This material is only meant for documentation of the work and *should not* be examined as the production part of this thesis. The production part is only the installation exhibited in Japan.

## **1.DEFINING THE SOUNDSCAPE**

To discuss the soundscape as the base for art projects, it's important to define it. The definition of this term seems to be difficult, because many uses have been assigned to it. I present in this chapter the origins of the term as well as some criticism by some theorists and researchers on the way the term has been defined.

### **1.1 Schafer and the World Soundscape Project**

Canadian musician and researcher R. Murray Schafer supposedly first coined the term “soundscape” in his book *The new soundscape (A handbook for the modern music teacher)* (1969). He researched the sociological and ecological aspects of sounds present in everyday life, trying to analyze how communities relate to their sonic environment and how people can learn to listen and affect this environment. Schafer himself claims that he invented the term “to be understood as the total acoustic environment, including all the noises, music, natural, human and technological sounds. I wanted to study all acoustic phenomena and their evolution through history in order to determine whether there were any particular or recurrent patterns that would make it possible to determine the principles of soundscape design” (Schafer 1994:11).

The origins of Schafer's research go back to 1970, when he funded the World Soundscape Project (also referred as WSP) at Simon Fraser University in Canada. His vision was similar to the Bauhaus movement in Germany: to be able to gather experts from different areas like musicians, architects and designers, to join forces and help arise listening awareness, and design a new sound environment. (Schafer 1994:14). Better planning, better listening and better understanding of the sonic surroundings would

improve this sound environment. The group acquired recognition with their project *The Vancouver soundscape* (1973), a set of recordings made in the city of Vancouver, with the purpose of documenting and analyzing different soundscapes found in the city. The outcome of this project is a set of recordings of the city along with recordings of Schafer discussing the project.

## **1.2 Acoustic Ecology**

Acoustic Ecology is also a term of importance to the study of soundscapes, especially when discussing the aspects of recreation, as in the act of create again. As defined by Schafer, acoustic ecology

“Is the study of the effects of the acoustic environment or soundscape on the physical responses or behavioral characteristics of creatures living within it. In other words the soundscape is both positive and negative. It can be birds chirping or a jet aircraft taking off. Ecology is not simply an effect; it is a relationship”. (2012-2013:7).

As will be discussed with our piece *Polku*, I’m really interested in the ecological aspects of the work. I believe the relation between a person and the sonic environment is essential to develop sound art works that use soundscapes as raw material.

Some ways of working with soundscapes take form within acoustic ecology. Their procedures range from the purely aesthetical to the more ecological committed ones. Schafer was a soundscape activist: He wanted

to fight noise that he considered destructive, and wanted listeners to respect and protect their ears (Schafer 2012-2013:8).

Schafer also offers some concepts that help analyze the soundscape and are used, for example, by soundscape composers as a reference point for the analysis of their own work. I also adhere to these concepts when revising my own work. Some of these concepts are:

Hi-Fi soundscape: According to Schafer, it is “one [soundscape] possessing a favorable signal-to-noise ratio. The hi-fi soundscape is one in which discrete sounds can be heard clearly because of the low ambient noise level” (1993:43). According to this description, the ideal hi-fi soundscape would be that found on the countryside, where only nature sounds are present. Schafer has a preference for avoiding sounds that he considers noise. This preference of course is entirely subjective.

Lo-Fi soundscape: In this case sounds containing details are masked by noise and become lost in a mass of sonic pollution (Schafer 1993:44). In this sense, the natural scenario for the Lo-Fi soundscape is the urban environment.

Schafer clearly advocates for societies to aim for a hi-fi soundscape, trying to return to natural environments. Based on this idea, some authors criticize Shaffer for adopting a negative position towards the urban soundscape. Sound artist Sophie Arquette claims that

“to say that the urban supervenes upon the natural soundscape, and that urban sounds can be cleaned up to resemble natural sounds is to misread the dynamics of city

spaces. A city wouldn't exist if it mirrored agrarian sonic space" (2004:61).

Schafer's classification subjectiveness has also gained critics from other authors. In the words of Ari Y.Kelman: "The devolution of Schafer's soundscape is so totalizing, so deterministic, that it provides little hope for the ears of humanity against the din of his historiography"(2010,6). Both authors in their texts express their disagreement with the approach that Schafer takes towards soundscapes. In his texts he expresses clearly his intentions and preferences of returning to a natural soundscape because nature sounds will never damage our hearing. (Schafer 2012-2013:8).

Both terms (Hi-Fi and Lo-Fi) can also apply to soundscape-based pieces. Noise and urbanity can certainly be interesting sonic elements to be used in a work and at the same time, they can activate the listeners' awareness towards the problem of acoustic pollution.

Within the realm of acoustic ecology, Schafer also categorized sounds in the soundscape according to their cultural value i.e. what they could mean for a specific society or group. The categories are: Soundmark, keynote and sound signals.

Soundmark: Borrowing from its visual counterpart, the landmark, soundmarks are sounds that have strong cultural meaning and define a specific place recognizable by a group.

Keynote: Keynote sounds could be thought of, as the "background" sounds from any given soundscape. Usually these are: wind, birds, traffic and



insects, among others. These are sounds we don't necessarily pay attention to, but nevertheless, establish an atmosphere.

Sound Signals: Opposite to keynote sounds, sound signals are sounds heard consciously. These sounds grab our attention and demand for careful listening. Some of these sounds are: sirens, bells and horns.

### **1.3 Is there a soundscape art?**

As presented by Schafer, the term soundscape is not necessarily related to arts. He is mostly interested in the ecological issues that arise from soundscape studies. He also exposes worries about noise pollution and asks for a listening learning, where people are able to discern sounds and to leave unwanted noise "unheard". (Schafer 1993).

As mentioned before, the World Soundscape Project (WSP) researched and archived soundscapes. First, locally with The Vancouver Soundscape, then internationally with projects like the Five Village Soundscapes project, that documented the soundscape of five different locations in Europe (1975). All this documentation implied recording the soundscapes. A certain conscious decision on how to record was made, in my opinion, to the point of becoming an artistic decision.

About this issue, author and artist Brandon Labelle discusses an interesting point related to how soundscape research and acoustic ecology can be thought of as an art form. He argues: "In setting out to archive, notate, and document environmental sound, acoustic ecology relies upon recording technology's referential character to fully mimic and embody "real" sound" (2006:205). The author claims that the use of technology to

bring soundscapes to the listener generates an interesting contradiction, altering the sense of location and space and providing a snapshot of sound that shouldn't be thought as a complete soundscape. The recorder is making a clear choice of technology to try to hide this very same technology with the “realness” of the sounds. Labelle argues that is possible to discover different aspects of the soundscape through the practice of recording. We can explore the environmental aspects of the place as well as the technological and creative approach used to bring the soundscape to the listener (Labelle 2006:205). The World Soundscape Project was the initiator of different practices related to soundscape that acknowledge the use of technology as means for achieving their artistic goals.

The practices of the WSP ended up as recordings and radio shows related to the subject. In my opinion, modifications made to the recordings for broadcast purposes, like editing and voice-overs, could be considered soundscape art.

Some artists were already working with the questions of listening, soundscape and presence, years before the appearance of the WSP. In his manifesto *The Art of Noises*, futurist artist Luigi Russolo exposes his views on how the coming of the industrial era brought with it a whole new palette of sounds and noises. Russolo believed that the sonic environment asked for composers to embrace this new soundscape, in order to create challenging and interesting pieces. (1913:25). Another renowned composer, musician and sound artist was John Cage. Since the 1930's he was arguing for a music of the world, and in the 1950's was creating pieces that treated all sounds as music, including silence, as in *4'33"* (1952), where the performer would remain silent, making the

audience aware of the sounds produced by them and the environment, becoming the performers themselves.

Another sound artist worth mentioning is Max Neuhaus. He worked with environments and tools different from the ones found in classical music halls. One of his main goals was to get the audiences to listen, and therefore organized a series of concerts with the concept as slogan. LISTEN (1966) was a piece where attendants would walk through a given path outside concert halls, guided by Neuhaus, to become more conscious about their sonic surroundings. It was the first of different kind of soundwalks that will be discussed later in this thesis.

It could be argued that, although there seems to be no reference to “soundscape art” as a term, many artists express soundscape -and in particular, *listening* to it- as being the base of their works. Several books discuss sound art, experimental music and similar subjects, but almost none uses the term soundscape as the base for the analysis of the artistic impulses, even if acknowledging it when presenting certain works. I actually found only one book whose name clearly establishes the subject: *Soundscape in the Arts* (2011). Probably a good term to use when analyzing these pieces would be soundscape-based art, although in this thesis I’m using both soundscape-based art and soundscape art indifferently. Throughout the rest of this thesis I’ll mention other artists as an historical and aesthetical reference and inspiration. The practices that I believe are more connected to Polku are going to be expanded in further chapters of this thesis.

## 2. SOUNDSCAPE AS NARRATION

I relate to the soundscape as a series of sonic events that can provide a narrative context. Each sound has both semantic and physical meaning, and they denote a certain surrounding. The meaning of these sounds becomes the driving element of this narrative when using soundscapes as the base for artistic creation. Some artistic techniques have used soundscape in this form, and I consider them of infinite value for my work, since their approach provided me with tools for designing Polku. I'll comment on the aesthetics behind soundscape composition, film sound design and video games sound design, among other practices, that appeal to these sonic experiences as a base for the work to be experienced. The practices set up a preliminary framework for the analysis of Polku, found in the fourth chapter of this thesis. I consider Polku an interactive composition where my role as an artist was to provide the sounds and rules for those sounds to be mixed into a soundscape collage.

### 2.1 Soundscape composition

Soundscape composition appeared as a development of the concepts proposed by Murray Schafer at Simon Fraser University. In fact, two of the most prominent figures in this area, Hildegard Westerkamp and Barry Truax, worked together with Schafer in different projects in the World Soundscape Project.

Soundscape composition takes a step towards a more artistic approach to soundscapes. By artistic I mean, in this case, the use of sound manipulation to give shape to soundscapes. Westerkamp and Truax use soundscapes as *sonic materials* to build their pieces. The sonic elements

can be processed, altered and edited, depending on the composer's views. Every sound and its characteristics is used to create a set of layers that fulfill the aesthetic experience *without* losing the ability to recognize the original soundscape or at least relate to it in some way.

For soundscape composers and their work is very important to retain the sonic qualities of the environment where the soundscape has been experienced and recorded. Soundscape composition is a way of listening to one's soundscape while, at the same time, experiencing the composer's point of view/hearing about the environment in question. Soundscape could be thought of as a collage of sound textures that belongs to a specific environment.

“A soundscape composition is *always* rooted in themes of the sonic environment. It is never abstract. Recorded environmental sounds are the 'instruments', and they may be heard both unprocessed or processed. Some soundscape works are created entirely with unprocessed sounds and their compositional process occurs in the specific ways in which the sounds are selected, edited, mixed and organized” (Westerkamp 2002:53 )

Truax's approach to soundscape composition is also based in ecology. Truax proposes that every piece composition should begin with a soundwalk. The soundwalk is a practice used by some sound artists to engage with the soundscape. According to Westerkamp “a soundwalk is any excursion whose main purpose is listening to the environment. It is exposing our ears to every sound around us no matter where we are” (2007,49). Soundwalks are a tool to explore the sonic surroundings, to

keep record of details in the space, to understand the changes that happen throughout time.

Truax even suggests that several soundwalks should take place for the artist to have clear aural understanding of the particularities of the environment they are going to be working with. After having a clear sonic image of the place, the artist can begin collecting materials for use in the composition. (Truax 2012:196).

Soundscape composition appears to me as a good starting point when working with sounds collected from a real environment. With Polku, I tried to apply some of the ideas expressed by these composers. Westerkamp has interesting thoughts on the artistic view behind the practice. For her the main task of the artist is to discover the essence of sounds recorded, because within the sounds is also the essence of the place itself. The artist should let the soundscape emerge and guide them in their composition (Westerkamp 2002:54).

Sound semantics are the reason why I chose soundscape compositions for this chapter. Chronological developments of sonic happenings are created and narrative aspects are present in the temporal subsequence of these events within an established framework. This narrative is more clear when sounds aren't heavily processed and sources are easily identifiable. Similar approaches are mentioned in the next subchapters with the difference that the practices mentioned use images to convey the narrative unity.

## **2.2 Film and video games sound design**

Sound design for film is one of the artistic areas where soundscapes are of great importance. A film's soundtrack is basically the arrangement of sonic elements to create a soundscape that affects the image and the story, according to the director's and sound designer's views. In this sense, sound designers are creators of fictional soundscapes that give both the space and place of the film its own sonic characteristics.

One of the most renowned sound designers for film is Walter Murch. Some of his credits include: *Apocalypse Now* (1979), *THX 1138* (1971), *The Conversation* (1974), *The Godfather II* (1974) and *The Godfather III* (1990). Walter Murch's work is of particular interest for the scope of my thesis, because he has theorized sound design from a soundscape composition point of view. Murch claims that his interest for sound came from musique concrete and tape manipulation, and when he started working in film, he wanted to create sound montages that, at the same time, could create sound environments for the characters in the films he worked for. (Murch 2010:34)

In his writings, Murch proposes some approaches for building the soundtrack that relate to soundscapes from an artistic point of view. At this point is important to underline that the sound designer in film has a moving image to work with, so aesthetical decisions must be made according to this. Murch's writings deal with this relation. Still, I believe his ideas can be adapted to fulfill the role of the soundscape as narration in other sound practices.

In one of his better-known essays *Dense Clarity, Clear Density* (2005), Murch explains his views on how the brain processes sounds according to their semantic content. This classification of sounds is useful also when analyzing works like *Polku*.

For Murch, channels of sound information are processed in different parts of the brain. The channels are usually found on movies: dialogue, music, sound effects and ambiences. Murch claims that sounds can be catalogued in different sides of a sound semantic spectrum, and argues that in the extremes of this spectrum are Dialogue/human speech (named as encoded language by the author) on one side, and music (embodied language) on the other. The basis for this division is the different parts of the brain activated by the sounds. Sound effects and ambiences are located in the middle of the spectrum. (Murch 2005)

I'm interested in his idea that several different elements (music, speech and sound effects for example) can be listened to at the same time, as long as the soundscape has diversity along the spectrum. Basically, Walter Murch is composing the soundscape: choosing elements according to their semantic "frequency" to avoid masking, taking into account the ability to *listen* to different sounds simultaneously, and creating a sense of place and time that is recognizable.

An interesting example where soundscape composition meets film sound is the movie *Elephant* (2003). The film tells the story of a school shooting at an American high school. This film features in its soundtrack some soundscape compositions made by Hildegard Westerkamp, that were originally released as part of an album not related to the movie. The use of her piece *Beneath the Forest Floor* (1992), while one of the most



important scenes of the movie develops (the first shooting), creates a new atmosphere that enhances the sense of alienation of the characters throughout the movie and in this particular scene. A soundscape composition has acquired a new meaning by being confronted with a new environment. Westerkamp thinks that recontextualization is the key for this experiment to success, as she would never have used the piece in the context of the scene. Still, she realizes that the darkness implied in both works (the film and the composition) underlines the tragic aspects of the events depicted (Westerkamp 2007). I believe this example reinforces the closeness between several of these practices. By using the piece with a new spatial context, it stops being a soundscape composition in the ecological sense to become a narrative tool within another form of art.

Mainstream video game sound design works more or less in the same way as film sound design. Usually, several technical and aesthetical procedures are related, and a big number of sound designers work in both areas indistinctly.

There's an interesting aspect in mainstream video games related to soundscape that is worth noting: Lots of information relevant to the gameplay comes from sound. In games like *Dead Space* (2008), *Bioshock* (2007) or *Battlefield* (2002), known as first person shooters, everything the players sees or hears is related to their character's position. Therefore, if the player wants to understand the situation (and avoid getting killed!), they must pay attention to soundscape cues as much as visual's. The soundscapes are built to represent a sense of space and time, giving to sound the physical characteristics that are expected in a continuously changing environment. Spatiality is a key issue in these games, since the

player only knows what is happening outside their own view range by hearing.

Video games that rely heavily in sound are called “audio games”. Some of these games are entirely based around soundscapes, where the narrative is built around what is being heard in the game space, and how it is heard. One of the most notorious examples is *Papa Sangre* (2010). There are almost no visual cues for the player in this game, so every decision is made based on what is being heard. The soundscape, played in binaural audio through headphones, must be accurate both spatially and semantically. Every sound source must be recognizable and its position easily perceived for the player to advance or achieve their goals.

Soundscape composition, film and game sound design, are some of the examples I used in this chapter to express my interest in the narrative possibilities of soundscapes. By choosing, manipulating and organizing sounds, it is possible to convey a sense of narration. *Polku*’s sounds are also designed to work in this way: as the user explores the piece, the sources of the sounds tell a sequence of events that can be considered a narration.

### 3. SOUNDSCAPE AS RECREATION

The discussion about soundscape and its relation to different sound practices has another side of importance for my work in Polku: How “faithful” to reality must soundscapes be, or put in another way, are soundscapes *produced* by art supposed to emulate reality? Artist Jana Winderen, who has used soundscapes in her works, thinks is impossible to move the experience of being in a place to another, and therefore, doesn’t aim to recreate environments. (2011:257). On the other hand, artists like Kjell Samkopf approach their work from a “purist” point of view. His main approach is to leave the soundscape untouched, arguing that there is no sound that wouldn’t belong in his compositions (2011:305).

In this chapter I present different approaches towards these questions. Some forms of soundscape-based art are supposedly trying to represent a specific environment’s soundscape using different recording techniques that intend to hide the machinery behind the process. Others try to create their own realities based on the sounds provided by the soundscape. New media has also brought new possibilities for the use of soundscapes and some practices that make use of it will be mentioned.

#### 3.1 Field recording and Phonography

The clearest example of a soundscape-based art that aims at achieving recreation is Phonography. The term refers to an “aural photography”, and defines the practices also referred to as field recordings. In these

practices, the sound artists or phonographers, try to capture a specific soundscape in the most “transparent” way.

Phonography has been practiced for different reasons: archives, noise pollution research and acoustic ecology, and sociology, among others. For some years, it has also been explored as a musical practice where the phonographer is considered a curator because the process of creation involves choosing sources instead of composing (Bernstein, 2003). This view of the artist as a curator is of extreme importance in my work. As will be described in a further chapter, my work as sound artist in “Polku” oscillates between the field recording practices and collage or collection of sounds.

About the process of recording and editing a soundscape for research purposes (eco-acoustic compositions), sound artist David Monacchi considers of great importance to respect the research and nature of the soundscape. The ultimate task, he argues, is to “aim to immerse the listener in the complexity and stability of the original soundscape, always trying to maintain the focus on the environment itself” (2011:240).

Polku doesn’t try to recreate an existing soundscape as phonography does. I consider the mention of field recording important to my work, because Polku presents a soundscape that *could* be possible. I recorded and used isolated sounds with small adjustments. for the piece. The sounds were recorded with a phonographic approach but with a different purpose.

### 3.2 Augmented soundwalks

As explained before, one common practice among sound artists preparing a new piece based on soundscape is the soundwalk. Soundwalks have taken a new turn thanks to different technological applications, from portable cassette and cd players, to mobile location. Soundwalks as investigation tools take advantage of this technology to provide new ways of working, to recreate the feeling of space throughout soundscape. Could Polku be considered an interactive soundwalk? Depends on the view. I think it resembles soundwalks in that the user is walking and listening actively in order to discover new sounds. Recorded soundwalks relate strongly with phonography. Both entirely depend on the veracity of what is being heard. Also, both try to present a specific soundscape with all its characteristics and fluctuations.

Janet Cardiff is one of the most renowned sound artists of the moment. Together with her husband George Bures, they've made several sound installations that have been shown around the world. Cardiff has also some projects of her own, including Audio Walks. In them, Cardiff provides the listener with a portable sound system where a recording is heard. The listeners begin their walk according to a set of instructions in the recording. What is being heard are the sounds of the same places where the walk happens. The added feature is that Cardiff has also created a storyline related to that space -told by her in form of a narrator-, usually dealing with her feelings about the place. What the listener experience is a type of augmented narrative soundwalk: The soundscape is recreated to the point where it gets difficult to differentiate between the recording and the actual soundscape. This "naturalness" is somehow cancelled by the appearance of a narrative storyline when the voice

guides the listener into a story. Here, the authentic of the built soundscape is used as a platform to achieve the experience of immersion.

Another interesting project related to Cardiff's audio walks is Google Nightwalks (Google Inc. 2014), a guided immersive tour through the streets of Marseille, France, using Google Chrome browser as platform. The experience mixes Google's Streetview, maps and sound. There are two main layers of sound: A narrator/guide telling about the place, and a second one where the place's actual soundscape is heard as it changes according to the viewers' location. In this project is also of utmost importance that the soundscape feels realistic, especially since it is "giving life" to the static images of street view.

### **3.3 Mobile apps and social network sharing**

Several applications for mobile devices have been developed partly inspired by Schafer's work. These applications are based on one simple principle: to record the sound environment of a specific place and share it with other users through the mobile app or web page, then explore maps, thoughts and comments about the recordings. Some of the web projects are Sound Around You (University of Salford n.d.) and Global Soundscape (Purdue University n.d.). The biggest achievement of this type of applications is making soundscapes global. Although I think the concept could be developed further, the basic idea of sharing self-recorded soundscapes reinforces the listeners' attitude towards sonic environments. So far many of these applications and websites gather sounds from users and puts them in a database along with metadata. I believe this sounds could be put in use on further ways of expression, as materials for soundscape compositions and experiments.

Other applications that also relate to soundscapes are those who offer pre-made sounds to be listened to under different circumstances. Usually these are nature soundscapes that are believed to have relaxing properties. Applications like Sleep Time (Azumio Inc. 2012) and Dream:on (Yusa 2014) , offer the possibility of listening to different soundscapes while going to sleep. In these cases, the advantage of using mobile technologies is that the apps can receive data from the user (like the amount of movement while sleeping), so that the soundscapes play according to this data. Applications like Soundshade (Soundage oy 2015) on the other hand provide the possibility to choose and locate sounds in the soundscape to increase productiveness. These soundscapes must resemble original sound atmospheres to achieve their goal. Therefore, it is of utmost importance that the sounds, and their spatiality, are reproduced as faithfully as possible.

The reason behind the mention of these practices is the common idea to create awareness about the soundscape, and to allow the sonic surrounding to affect us. Polku addresses also this issues from a different perspective and technique, but with the same core questions.

#### 4. POLKU



Figure 1. Polku set up and running in the border of the Spiral Hall, underneath the ramp.

Polku is an interactive sound installation realized by Valtteri Wikström and myself, to be presented at Spiral Hall building in Tokyo, Japan, in May 2014, as part of an exhibition called Sounds from Finland, set up by students of Aalto University.

Polku was created within a course called “production clinic” at Media Lab, directed by Pipsa Asiala. During the course we planned the pieces that would be exhibited in “Sounds from Finland”. Already at early stages, team groups were formed. Valtteri and I joined to work together since the ideas we had worked well combined.



Polku's main idea is to recreate/present Finnish soundscapes by means of a path throughout visitors walk. The path is made of six steps -built out of weight scales- where the visitor stands. This action activates the scale. Based on the user's weight, an id is sent to the computer where the software (Pure Data) is running. Each id is given a specific sequence of sounds that are to be played, one by one, as the user advances through the path. When stepping on the first one, only one sound is heard. By the time the visitor has reached the sixth step, a complete set of sounds resemble a soundscape.

Speakers located at both sides of the scales play the sounds. All sounds are monophonic; so all speakers at both side of each scale play the same sounds.

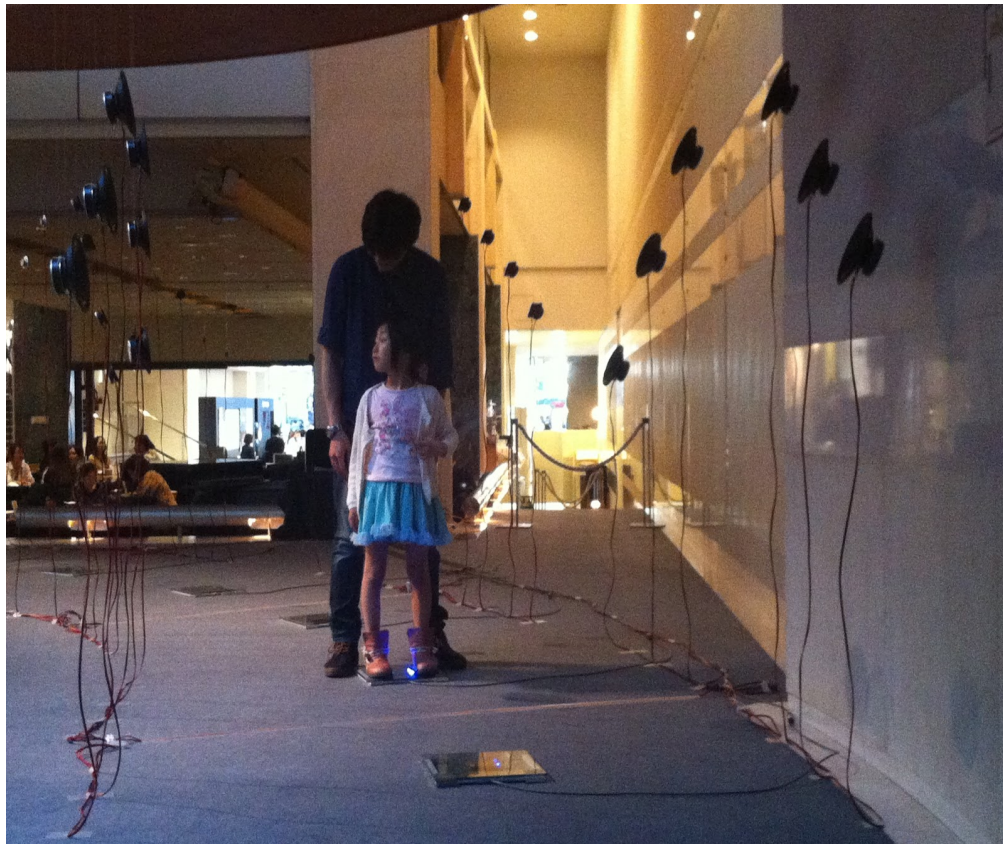


Figure 2. Visitors explore Polku

#### **4.1 Is Polku a soundscape art piece?**

In the previous chapters I've described some of the practices that use and/or produce soundscapes as their main goal. The techniques and approaches vary heavily from one piece to the other, and is difficult to categorize an artistic work as a soundscape art piece. I'd argue that a soundscape piece is one that relies completely on soundscapes as defined by Schafer, meaning specific sonic surroundings. It does not mean that a realistic soundscape has to be the final goal of the piece, since it could also be based on soundscapes and presented in non-referential ways.

Polku's intention was to present Finnish soundscapes by means of interaction. The sounds the user hears are not necessarily an existent soundscape, but instead, my view of what a Finnish soundscape could sound like. The sounds could be thought of as a "collage", a collection of sounds, where each sound has its own independent identity. By using the referential and semantic, I propose a new structure where sounds interact with others creating alternate results. Polku, therefore, can be thought as a soundscape art piece because it uses soundscape as its source and sets the tone for a reflection on what a soundscape could be.

Apart from the artists and works mentioned before, there were some other sources of inspiration for the main concepts behind Polku. One of them is sound artist Bill Fontana. He uses soundscapes as base material for his work. I'm interested in his practice called "resoundings": relocating soundscapes of specific places into new contexts, as in his works *Vertical Water* (1991) or *Harmonic Bridge* (2006). Fontana explores the question of whether this relocation could make sounds plausible in

their new context and how he can expand the acoustic horizon of the new location. Explaining the goals of his approach, Fontana states that:

”I hope that it can add a new experience, because I think that one of the issues we have in our culture with listening is that we learn not to pay attention to sounds in the city and the environments we’re in. Throughout my career the act of listening has been a way of making music, and I guess I like to make projects that cause people to increase their acoustical awareness of their environment and engage in some way”(Fontana, 2012).

With Polku, and in general throughout my career and studies, I’ve tried to address this issue: to make the listener active and aware of the soundscape. I believe Polku’s design addresses this issue satisfactorily, since the way the sounds were played asked the user to pay attention and realize that a new sonic environment is taking place, one sound at a time.

## **4.2 A palette of sounds**

Polku is a soundscape-based sound work designed for an exhibition to be held in Tokyo, Japan. The sounds that take part of the installations were carefully chosen with this requisite in mind, allowing for a certain “naivety” when doing the selection. By naivety I mean choosing sounds that could be taken for granted for people living in Finland, but not necessarily outside the country. After all, the idea was to introduce visitors to a selection of Finnish soundscapes. As an artist, I decided on several factors like which sounds would take part of the work and how I would like them to sound.

As a guideline for choosing the sounds, I went by my own experience as an immigrant in Finland: What sounds describe better the experience of being here, and what sounds could convey info to audiences located so far away? Given this subjective choice, it must be underlined that Polku does not try to realistically recreate an existing soundscape. Instead, it tries to generate a soundscape-based interactive sonic experience. This experience allows the user to relate to specific time-space aural events with strong semantic meanings.

For me the experience of living in Finland is sonically interesting, given the fact that there's a strong correlation between the urban and the rural. One finds echoes of both throughout the country, and the differences increase as we move north, where there are no big urban centers. From this perspective, I tried to create an amalgam that could provide listeners information on how these different environments coexist and also, what kind of mixtures can be perceived. It was also of crucial importance to know that the piece was going to be exhibited in Tokyo, since it is one of the biggest urban environments in the world and, as an artist, I was really interested in people's reactions when confronted to the contrast of sounds from city and nature.

The sounds I chose could be considered as being part of either nature soundscape or urban soundscape. For this decision, some aspects were taken into account:

- Since there was certain randomness in the order of the sounds being played, sounds should be identifiable when played along other sounds coming from the same set of speakers. Also, sounds shouldn't mask each other, so levels and frequency range should be carefully planned.

- Sounds should create a sense of unity, regardless of the order they were played at. For this reason, we decided to keep the categories above mentioned -nature and urban-, so they wouldn't create soundscapes that could be felt like not belonging to each other.

The sounds heard in Polku are divided in three main groups or "narratives". Each of these narratives is assigned to a specific user and is heard progressively: First, one sound is played, and as the user walks through the path, more sounds of the same group are added to the soundscape. I chose these sounds according to my thoughts on the soundscapes to be achieved.

#### GROUPS OF SOUNDS USED IN POLKU

1.	2.	3.
Water drops	Footsteps	Church bells
Tit (bird)	Elevator	Dogs
River	Escalator	Ducks
Nightingale	Metro	Branches
Thunder	Trains	Steps in snow
Seagulls	Train's P.A.	Nightingale (2ver)

Also there are two background sounds that create coherence between the punctual sounds. They also provided smoother transitions, given that after some time the ear becomes used to them and it doesn't bother listening of the other sounds. The background sounds are:

- Nature background: Mainly a soft wind sound.
- Rain background: Small rain that falls continuously.

In the next pages, each group would be described along with a frequency analysis of the soundscape. Note that the screenshots only represent one moment of the sounds, so it doesn't perfectly show the average frequency spectrum of all sounds in time.

Group No.1: This group has sounds that belong to nature soundscape. No presence of human made sounds.



Figure 3. Frequency analysis of the first group of sounds

The frequency analysis of this soundscape is interesting given its spectral diversity. Sounds had great variety of frequencies and it was easier to listen to them separately.

Group No.2: This is a pure urban sound with mechanical and human made sounds.

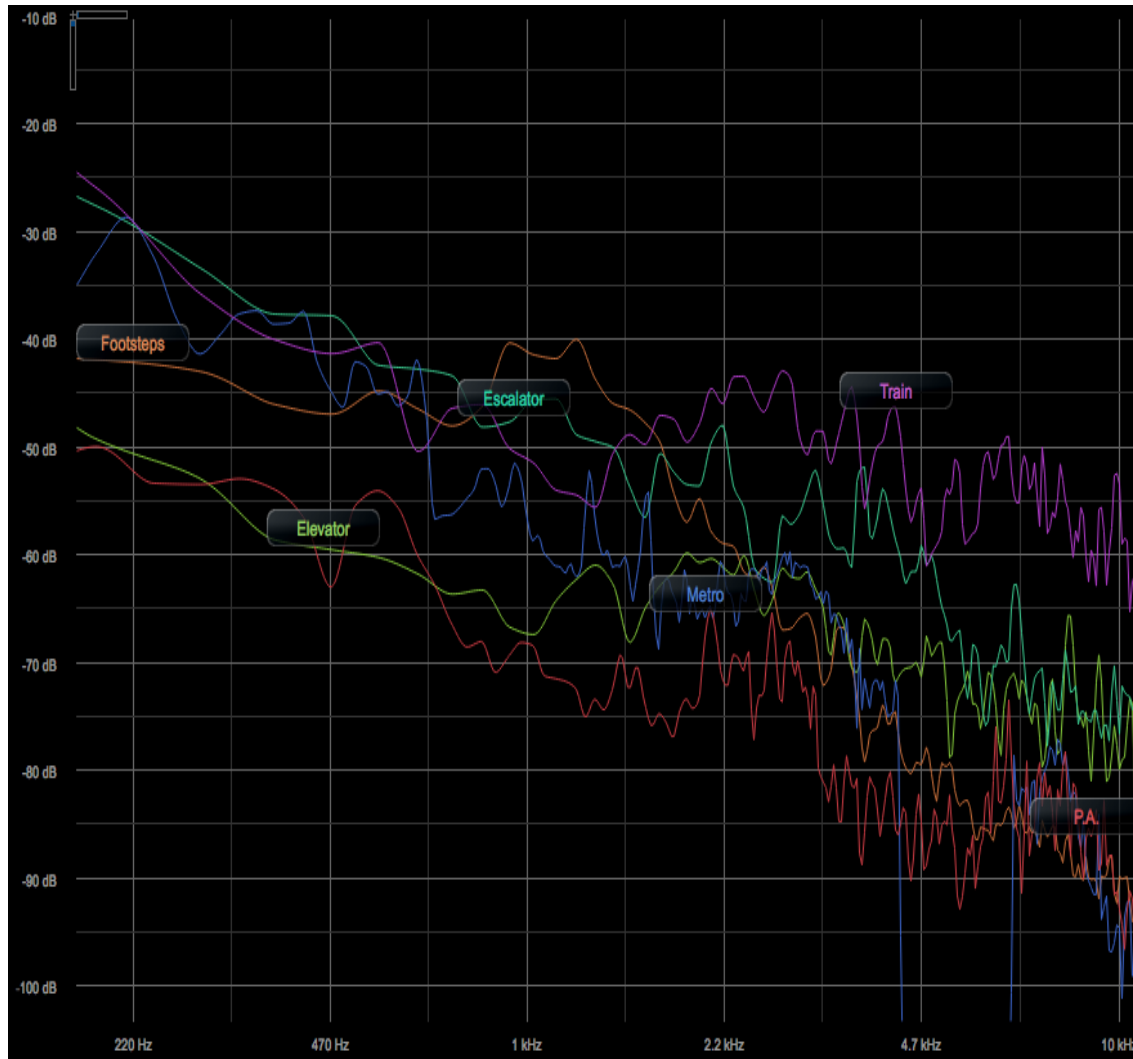


Figure 4. Frequency analysis of the second group of sounds

This soundscape was more complex because most sounds were mainly located in the same frequencies. This was a conscious choice. I wanted to experiment with the separation between mechanical sounds. Some of the sounds have volume and frequency peaks that make them more distinguishable, as in the case of footsteps and escalator.

Group No.3: This group is a mixture of human made sounds and natural sounds. The main idea was to create a balance between both worlds (urban and rural), so I tried to evoke a village-like soundscape.

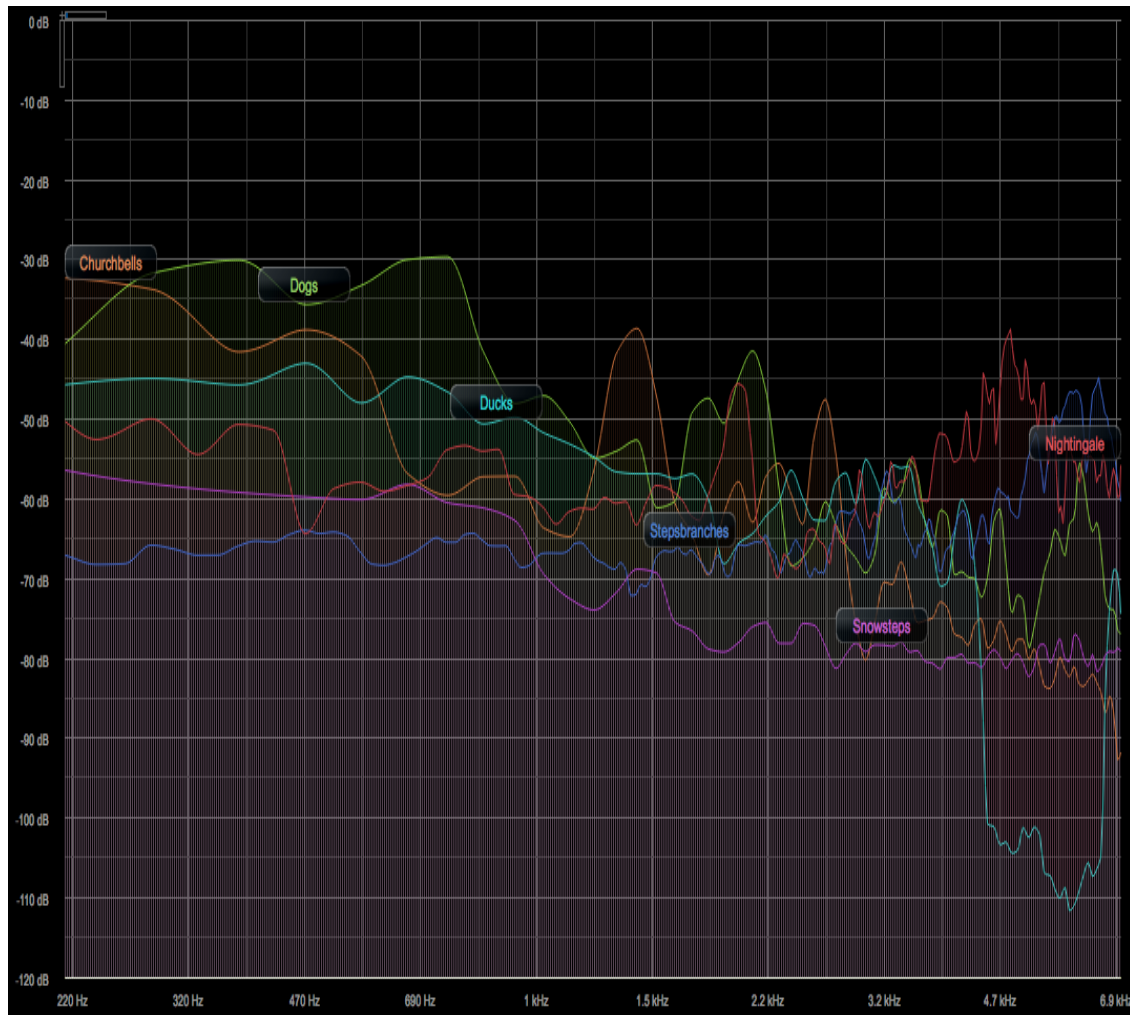


Figure 5. Frequency analysis of the third group of sounds

This soundscape resembles the first one. There are human-made sounds but none of them have noticeable mechanic sound. Of special interest for me was to see how sounds with a strong meaning, like church bells and dogs, could be listened to clearly, despite using lots of shared frequencies.



### 4.3 About interactivity in Polku

Polku is based on interaction. Interaction was an absolute necessity for the project, basically for two reasons:

- The final soundscape for each user was built by collecting sounds, one by one. It was important for us that the users were in control of the speed of their walking and the time it would take them to listen to the sounds of each step.
- We wanted to create specific soundscapes for specific users. The interaction design provided the data for the system to recognize a specific user (according to their weight). This was fundamental to the piece, since each user id would determine what group of sounds would be played.

To understand why the interaction is necessary, is useful to think what kind of work Polku would be without it. First, the steps would be just an ornamental detail. Users would step on them but, since it wouldn't affect the sounds, they would skip them quickly. The idea of the "path" would also lose its value, since there wouldn't be a clear trail with steps and stops. Of course this could present interesting opportunities, given that the users would be freer to walk in and around the piece.

The sounds could be the same but played as a loop of the three groups, one after another. I believe that it wouldn't have the same effect, especially as a listening awareness device: If everything sounds all the time, is easy to lose concentration and "send" those sounds to the background. Polku's interactivity creates just the opposite. Users become active listeners and soundscape makers by playing the sounds according to their movement.

#### 4.4 A space within a space

Polku is an installation that creates its own borders and forces the user to behave in a certain way within these limits. For that reason I believe it is important to revise the way some installations work in relation to the space and the position of the user in this space.

Artist couple Sabine Schäfer and Joachim Krebs have been working with sound installations for at least 30 years. Their pieces have been exhibited around the world. In their text *Sound – Time – Space – Movement: the Space-soundInstallations of the artist-couple <sabine schäfer // joachim krebs>* (2003), the artists propose a typology for a classification of sound installations that I consider appropriate to discuss Polku's design in reference to the space of the exhibition. This typology is not intended to embrace every single installation made. Instead, it is an interesting point of departure for own works analyzes.

The artists propose a typology conformed of 5 different types of installations:

- The Space-soundObject: These are sound installations designed to have the speakers arranged in a way that sound radiates in only one direction, with the visitor facing the sounds. Usually the speakers are set against a wall.
  
- The circumambulatory Space-soundBody: These installations are usually sound sculptures that project sounds in different directions and can be explored by visitors from different sites. The name hints at the possibility of surrounding the piece.

- The enterable Space-soundBody: These are installations that directly affect the architectural space. In this type of sound installations, speakers are located within the space in a way that takes into account its physical properties. The characteristics of the sounds blend with the way the space affects these sounds.

- Space-within-space: This category implies the construction of a new place inside the exhibition room, but not strongly related to it. Visitors outside this new place can experience it like a circumambulatory Space-soundBody.

- The concert Space-soundBody: This category refers to performative scenarios where there is a beginning and end, and the situation is planned for an audience. Basically, electroacoustic concerts fit in this category.

So, where does Polku fit in? I'd say is a mixture of categories 2-4. It creates its own space by surrounding the path with the speakers and to experience it fully, one has to be inside the work. On the other hand, the work can be heard from outside and, in principle, it can be experienced from different positions. What the above categorizations don't mention is interactivity. None of the works used by the authors to exemplify their text is interactive. Therefore, category number 4, Space-withinspace applies in my opinion the best, because the visitor won't be able to experience the piece as we intended it in another way than entering the path, the new space.

## 4.5 Spatial considerations

I consider Polku to be an art installation. Its planning had to take into account the space where the work would be set up. The work would be built *for* the space. This was challenging, since it was impossible to visit Spiral Building before setting the piece, but also forced us to come with different possibilities and for problems that could emerge in the space. Also, because there were other three sound pieces set up for the exhibition, sound levels and positioning were an important matter to remember.

The main working principles of Polku were already decided at the early stages: There would be steps in the path, made of weighing scales that would provide the input data for the interaction. Several speakers on top or surroundings were used to play the sounds.

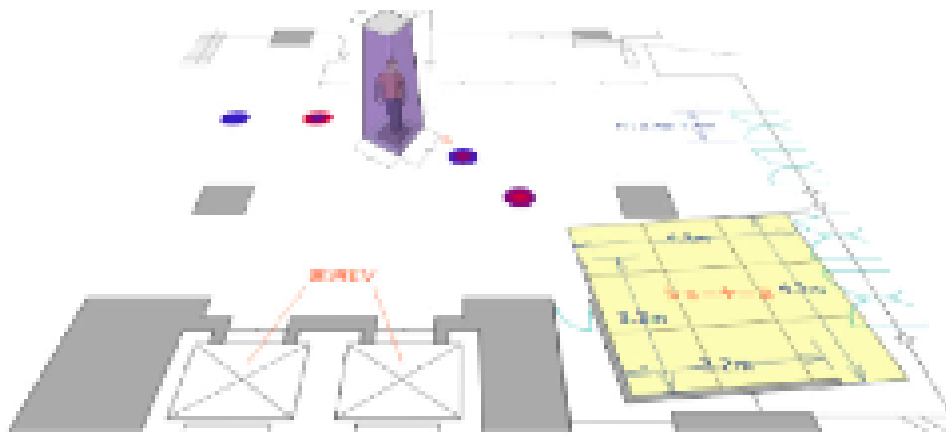


Figure 6. First version of Polku: Different location. Steps already in use, sounds from Panphonics speakers on top of each step.

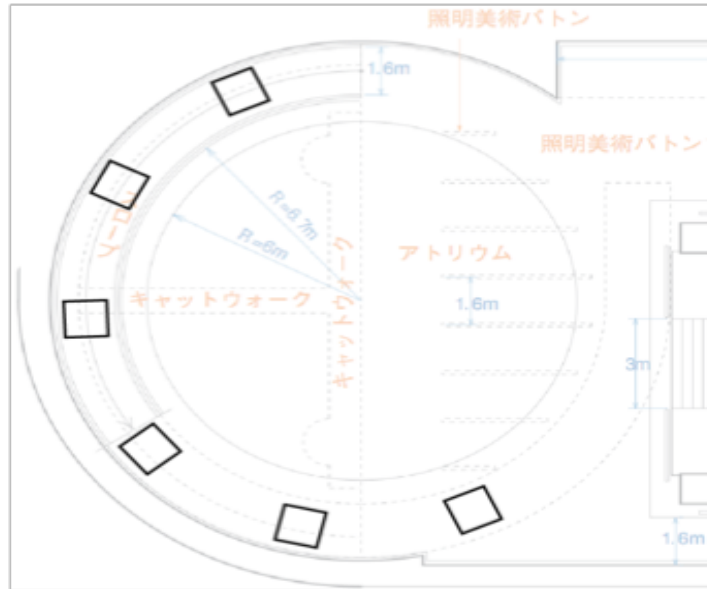


Figure 7. Second version of Polku: the steps are planned for the ramp with speakers along the rail. Didn't work because it obstructed mobility.

One of the main factors when choosing the sounds was how well they played when sharing the same space with other sound pieces in the exhibition. At first, I had decided to use long ambience sounds, filled with grumble and chattering but it didn't work. When played along the other pieces and taking into account the fact that there was an actual restaurant right beside the exhibition, the sounds just lost any meaningful information.

Following the advices of teachers, I changed my approach towards more punctual sounds. We were lucky that the sounds of the other two installations sharing the space, Kivikasa (artists: Ari-Pekka Leinonen and Saku Kämäräinen) and Luonto (Johanna Rotko and Kirsi Ihalainen) merged nicely with the sounds from Polku. The first one used the sound of the kiuas (sauna stones) to create a multi channel sound, while Luonto used sounds and frequencies heard in Finnish forests. There was no disturbing among the pieces. It could be said that they almost

complemented each other. The fourth piece Leija (artist Juan Duarte Regino) played sounds over headphones, so it was not an issue at all.

It was extremely important to be able to demo our works before the exhibition. We worked for a month in the LUME film studio at Aalto University, where we set-up a first version of our installation and tried to give its final shape. After this month we were given a workspace at Media Lab's premises in Otaniemi, where we were able to have some user tests.

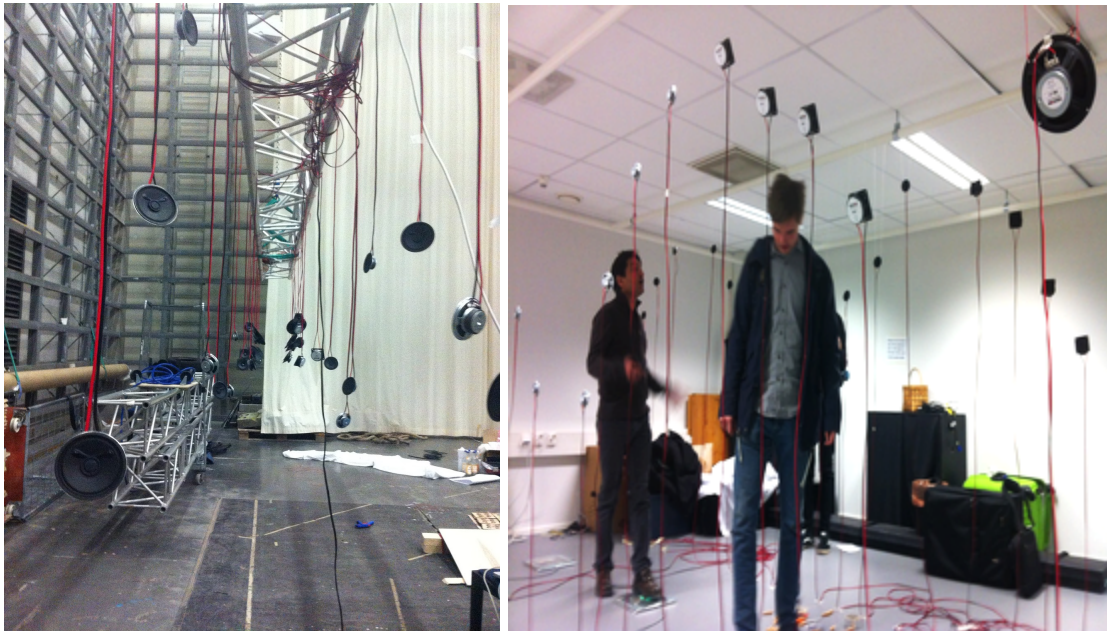


Figure 8 and 9. Preliminary tests

Spiral hall was a challenging yet rewarding location. The space where the exhibition took place is designed so that the visitors feel encouraged to go forward, to explore. In this sense, I believe the pieces were put in the right places. It created a logical path for visiting and experiencing the works.



Figure 10. In this picture the four works can be seen: To the left Kivikasa, to the right Polku, in the background Luonto and upstairs Leija

Maybe the most challenging part was the restaurant next to the space. Although at the end it didn't disturb the exhibition, it provided for an added soundscape. In the aftermath, I like the idea of working with soundscapes and having to adapt to the sounds of the new location. This is what (sound) installations should do, in my opinion.



## 4.6 Visual design



Figure 11. Side-view of Polku being experienced

Although Polku is an interactive sound piece, the visual aspects of the work were of extreme importance. Already in the creation process we knew we would use scales for the identification of users, and that they should be also seen and felt by them. After some discussion about the possibilities of the visuals, that included panphonic speakers and covering the scales to make them look as tree trunks, we decided on the “naked electronics” aesthetics. We felt this approach gave the piece a whole new dimension: to visually reinforce the same contrast we were trying to achieve with the soundscapes. The natural and the urban, and the organic and the artificial, were the ideas we implemented in the design of the piece.

The visual design of the scales was the first decided component. Valtteri had already done some tests with transparent scales and we thought it would be interesting to be able to see the electronic components that allowed for the scale to work as the interaction interface. In the process,



we also felt we could add some visual signal for the user to know that their scale was being activated, so Valtteri added small LEDs that changed colors when being activated. The scales had to be filled with aluminum and copper tapes that were also visible for the users because there were some problems with the amount of electronics being exposed to cables and magnets.



Figure 12. Scale in action: LEDS indicate the user has been recognized

#### **4.7 A path of speakers**

Speakers are one of the most important components of Polku. Along with their basic function, that is, reproducing the sounds, speakers are part of the identity of our piece.

Speakers have been the subject of discussion among sound art practitioners and theorists for a long time. Already when discussing soundscape compositions, its paradoxical aspects have been noted: For a soundscape composition to be listened to, a system of speakers must be

used. The sense of place is produced by artificial means and transported to a different location (that of the listener).

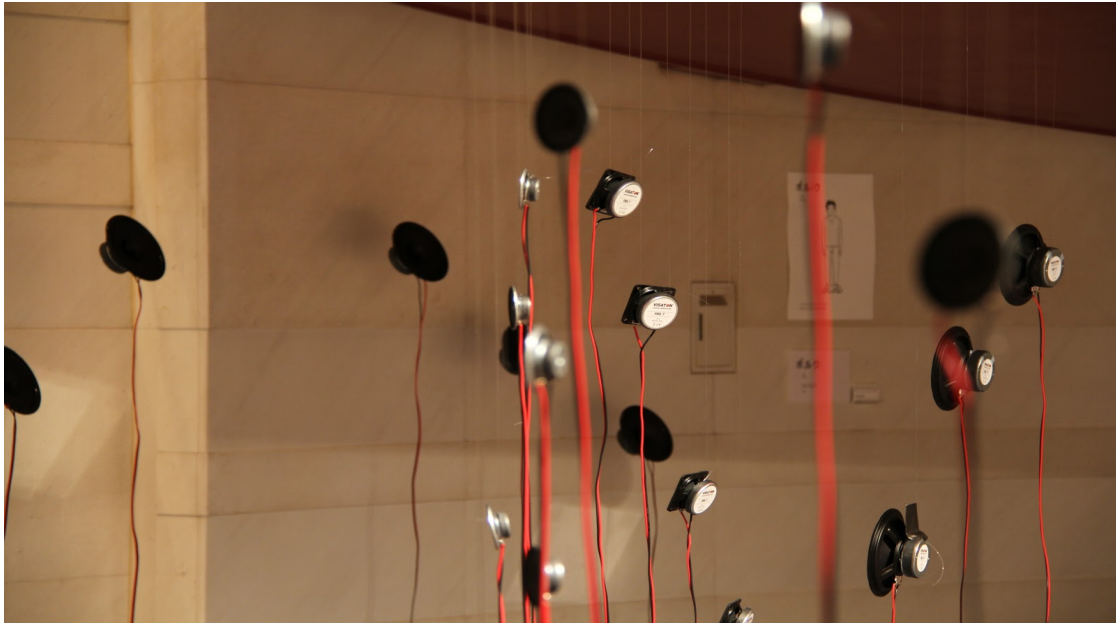


Figure 13. Speakers of Polku

Two aspects of speakers' use in Polku are to be discussed: Their sonic properties and aesthetics.

#### **4.7.1 Speakers' sonic properties**

As mentioned before, Polku went through different changes in its main concept, including also the solutions for choosing speakers. In the first stage of the project, we discussed using panphonics speakers, also known as “sound showers”. These are directional speakers, usually set up above the listener, that are only heard when standing below them. At first, it seemed to be a perfect solution for us because one of the issues we were facing was “separating” Polku from the other pieces in the exhibition.

After some discussion we decided not to use them because the concept of the piece changed and we tried to incorporate speakers in a more organic way to the piece.

The final decision about speakers was using only cones, speaker elements without the enclosure. The reasons for this selection were mainly aesthetic but I also wanted to try to recreate soundscapes with these elements to enhance the feeling of the naked electronics; to strip the speaker of its cover and bring it to the basics.

The speaker elements used were of three kinds:

- 1) Cheap small elements (ø 77mm). Frequency range: 300 Hz-5 KHz
- 2) Visaton FRS (ø 63.5 mm). Frequency range: 200Hz-20Khz
- 3) Visaton BG (ø 170 mm ). Frequency range: 20Hz-20Khz



Figure 14. Polku just before the setup

The different speaker elements were chosen based on their frequency response and size. As the user walks through the path, the sound quality improves enhancing the feeling of contrast between the artificial and the organic. I think this goal was achieved, based on the users' response to the sounds: When entering the piece, most users wondered where the sound came from, and usually searched for a single point/speaker in an act of curiosity. As the user reached the last step, they usually looked up/down as a reaction to the virtual sound source in the center. This phantom source created a sense of immersion. (The sound of a thunder that is heard in the last step surrounded by the best speakers, provoked strong surprise reactions from the users).

#### **4.7.2 Speaker aesthetics**

The decision for the final speakers that we would use in Polku was made based on the contrasts mentioned before, like artificial/organic. The organic aspects could be presented by means of the shape of the speakers. In this sense, the work of two artists was of definite importance, and served as a big influence to Polku:

Roberto Pugliese is an Italian artist working with sound installations. I've been always interested in the visual aspects of his sound works and how speaker elements can influence the perception of a piece. He was also one of the first sound artists I knew about and only after I've learned several others have work with similar aesthetic approaches before him.





Figure 15. Aritmetiche architetture sonore, 2012.  
Roberto Pugliese.

Another artist that I consider as an influence, especially for my work in Polku, is Robin Minard.

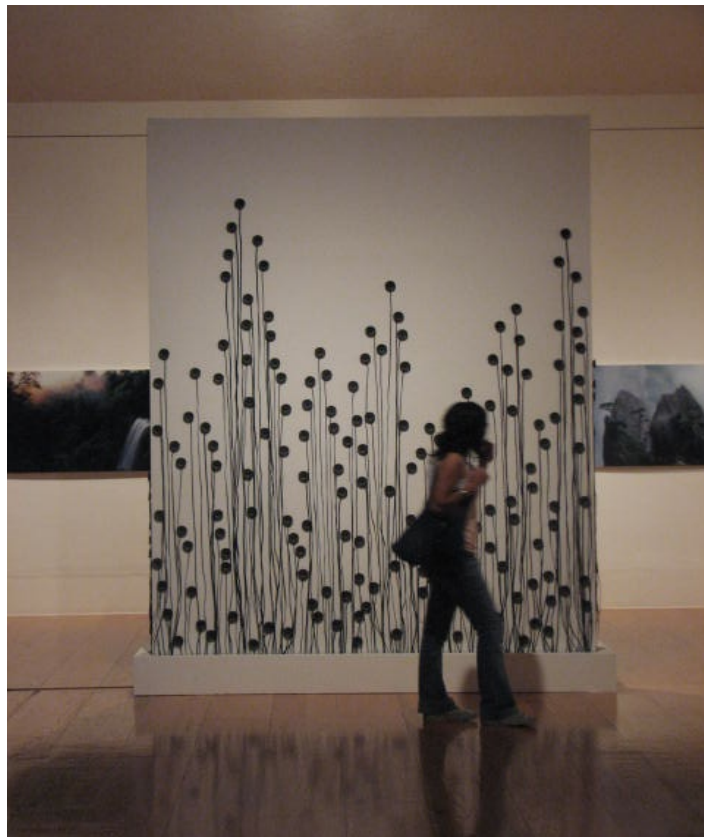


Figure 16. Silent Music, 2006. Robin Minard.

In both these works, the visual aspect of the speakers is equally important to the sounds. Minard's ideas about Silent Music could define almost perfectly Polku's aesthetics:

“Just as this aural experience presents a mixture of natural and synthetic elements, so does the visual. Although the work is composed solely of loudspeakers and loudspeaker wires, these are placed in a manner that suggests life, growth and movement towards light. This work inhabits the space in much the same way as would a living organism. At the same time it projects the observer back and forth between the perception of the familiar and the unfamiliar: between that which we perceive as being natural and alive and that which we perceive as being technical and artificial.” (1998: 105).

Polku's speakers behave like the ones describe in the paragraph. By rising from the ground they give a sense of organisms, like curious beings trying to take a look at the walker, and yet, surrounding them, almost guiding them through a discovery path.

Along with the speakers, it was decided that all other elements of the installation would be visible, according to the “naked electronics” aesthetics mentioned before. All speaker cables, joints, and even amplifiers were left for the visitors to see (not touch). I believe this was an interesting part of the experience and an added extra layer to the feeling of the installation.

In his doctoral dissertation, Robin Mcginley deals with some of these issues when analyzing his own artistic works and notes that :

“Careful consideration of how technological equipment is displayed and deployed can give rise to complex associative dialogues. By sublimating, or in other ways staging the physical presence of technology, an artist can delicately construct and influence the ways an audience will approach an installation, the manner of address and how their actual presence is implicated within the work.” (2009:51-52 ).

Polku’s aesthetics definitely influenced how users experienced the installation: By setting a path surrounded with technology and filled with organic sounds, the user had to adapt to the environment and realize that the soundscapes had a sense of displacement in them. The user is estranged within this organic system, reinforced by the rising of the speakers, as a living organism that will join you in your walk.

#### **4.8 Audience reception**

Visitors of the exhibition were enthusiastic about Polku. According to some conversations I had with them, and the guest book’s comments, they really enjoyed how the exhibition brought a piece of Finland to Tokyo. For me, it was particularly interesting to hear how many of the visitors expressed their satisfaction with the idea of being transported to a different location. Some said the nature soundscape meant to them an escape from the city. Others exclaimed how comforting it was to listen to sounds that brought memories of villages where they’ve grown up. The urban sounds weren’t mentioned too often, but I remember one of the visitors commenting how universal were these sounds. She said urban sounds reminded her of the fact that she never left the city and that Polku was just an illusion.

## 5. CONCLUSIONS

Conclusions for this thesis can be divided in two parts. The first one refers to the theoretical framework, discussing soundscape and its relation with sound arts. The second one is about Polku and what I learned through the building and exhibit of the piece.

Soundscape in the arts is a complex subject. In my readings I realized that soundscape, as the main idea behind the work, is not a term usually mentioned in the discussion and research of sound art. There may be different reasons for that: It could be that the soundscape, understood as everything we can hear in a specific place, is given for granted: If there's a sound art piece, it is by definition a soundscape art piece, because it is either using sounds or producing them. The term soundscape escapes a specific definition and, therefore, is unusable as a referential point for an art piece. If soundscape can be defined as everything that is heard, without spatial and/or social references, it becomes null.

It is also important to notice that in some art forms, soundscape can have a different name. When discussing films and videogames, it is common practice to talk about ambience and even room tone. Although they are different concepts, the main idea behind them is to reflect upon what is being heard in the world of the characters to create context and convey information. So, although a Schaferian analysis is not usually mentioned within the research of these media, the soundscape has a major role in them.

I hope the examples and analyzes presented in this text help to understand soundscape as a construction with certain characteristics that



can help define a specific set of artworks *without* a single categorization. Soundscape art refers, then, to a set of works that actively use and understand soundscapes, and create works that attempt to shed new lights in and about the sonic environment.

I would be interested in continuing research on the subject, especially on a local level. There's strong interest in soundscape research and related issues in Finland. The Finnish Society for Acoustic Ecology is one of the most known groups in the world working on the subject. I would like to know more about (sound) artists working with soundscapes in the country. As mentioned before, Finland offers several contrasts in the sonic environment and multiple possibilities for approaching soundscape and its aesthetical uses.

Polku was an enormous learning experience in different levels. First, it taught me a lot about setting up, connecting and solving problems when using several speakers. Thanks goes to Valtteri for helping me sort all those things out. I believe the results were really good and we were proud of the work.

Polku also provided new insights into my work and the use of soundscapes. Based on the feedback, I'd say that soundscapes affect people in really strong ways. As an artist, I would like to keep exploring this relation between people and surroundings. For this, I would like to keep developing projects where soundscape as sound material and inspiration is used, altered and produced. Polku could become a changing project, where the sounds heard do not belong to the place where it is presented. Based on Tokyo's experience, this seems to be the strongest point of the work: to be able to take the user to a different, remote place.

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## **DVD-Disc**

Photographs and videos documenting the installation exhibit in Japan. This material is not the production part of this thesis.

